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GIFFORD PINCHOT, Forester.

FOREST PLANTING LEAFLET.

FENCE-POST TREES.

REQUIREMENTS.

In planting trees for fence-post production the first and most important requirement is the selection of suitable species. A fence post should be made from wood of moderate strength, able to hold staples well, and durable in contact with the ground. Numerous trees have these characteristics, but to make a successful plantation and to secure early returns the species chosen should, in addition, be of rapid growth and well adapted to the locality. Nearly all the older forest plantations in the prairie States were made for protective purposes. Rapid-growing species, such as cottonwood and silver maple, were chosen. In many cases they were not adapted to the locality, and failed. Those plantations which succeeded are now furnishing fuel and some lumber, but not the fence posts the market demands. In more recent years the importance of growing more durable timber has been recognized. A forest plantation may often serve both as a woodlot and as a shelterbelt for crops, stock, and farm buildings. If trees suitable for fence posts are grown, they will furnish the desired protection and also yield a salable product.

SPECIES.

The best species for post production are chestnut, European larch, catalpa, black locust, Osage orange, and Russian mulberry. None of these trees should be used except within their economic planting range and on soils adapted to their growth. In States where several of these trees can safely be planted, the choice will naturally fall on the best grower or the one that will meet the special need of the owner. Elsewhere other less valuable species may be preferable because of their hardiness. Thus, in the semiarid region where other species would not thrive, green ash and honey locust have been grown with good results. These woods are fairly durable if well seasoned. White willow also has been extensively grown for fence posts over a broad region in the Middle West. It has the advantage of unusually rapid growth, and the seasoned wood lasts several years. But the use of any of these species is unwise where more durable trees can be grown. The advisable planting range of the species recommended above is as follows:

Chestnut.—Light, porous soils in southern New England, New York, Pennsylvania, Ohio, and other States within its natural range of distribution. It is not adapted to the soil of the prairie States or to limestone formations.

European larch.—Well-drained sites in New England, New York, Pennsylvania, Ohio, Indiana, Illinois, Iowa, Michigan, Wisconsin, Minnesota, and the eastern parts of the Dakotas and Nebraska.

Hardy catalpa.—Deep, fertile soils with sufficient moisture and good drainage in Ohio, Indiana, Illinois, Iowa, Missouri, eastern Nebraska, eastern Kansas, and eastern Oklahoma.

Osage orange.—A variety of soils in the central and southern portions of Ohio, Indiana, Illinois, Iowa, and eastern Nebraska; favorable situations in western Nebraska, Kansas, and Oklahoma, eastern Colorado, and New Mexico.

Black locust.—Well-drained soils from the Rocky Mountains to the Atlantic coast; but in the Dakotas, Kansas, Nebraska, Iowa, Illinois, Indiana, Ohio, and Pennsylvania planting is wholly or partially prevented by injuries caused by the locust borer. West of the Rockies the black locust has been planted to a limited extent with marked success and with entire immunity from the attacks of insect pests.

Russian mulberry.—Kansas, Oklahoma, and the Indian Territory. Useful in those localities where better species can not be grown.

PLANTING.

When the proper species has been selected, the second essential is the careful performance of every detail of the planting operations. In the prairie States it is usually necessary to prepare the site as for a field crop. Hardy catalpa needs thorough soil preparation, regardless of the region.

Care and promptness must be exercised in setting the trees. The stock should be planted as soon as possible after it is on the ground. The roots of all the young trees must be kept moist and the planting done carefully and thoroughly, with special attention to packing the dirt firmly around the roots. Even after a wise choice of trees, failures frequently result from improper handling and careless planting.

If post production is the primary object, any of the species mentioned may be planted pure; if it is secondary, mixtures, such as chestnut with oaks, or larch with pines, oak, or chestnut, may be used.

The best spacing distance depends largely upon the species and upon the local conditions of soil, topography, and annual rainfall. Generally speaking, the trees should be spaced from 4 to 6 feet apart each way, but in the prairie States of the Middle West, where cultivation is necessary, a spacing of 3 or 4 feet in rows 6 or 8 feet apart is often wise.

CULTIVATION AND CARE.

After the planting has been done, plantations in the prairie States should receive careful cultivation several times each season for two or three years. Loosening the ground and forming a dust mulch retards evaporation and protects the treets from encroaching grass. Unless the soil is carefully cultivated, forest plantations in many situations will almost immediately fail. Hardy catalpa plantations should always be cultivated.

To secure a straight, clean sprout for the main stem, such trees as hardy catalpa, Osage orange, Russian mulberry, and locust may be cut back to the ground during the winter of the second year after planting. During the first season of sprout growth one good, tall sprout should be chosen and the rest cut off. In this way the tendency to irregular and crooked growth may be avoided.

To force them into good proportions for fence posts, trees like Osage orange and Russian mulberry should, except when in shelter-belts, be kept well pruned of low side branches. The hardy catalpa sheds its dead branches very slowly, often letting in decay. It is therefore advisable, if the best results are desired, to keep the dead limbs trimmed off.

COST AND RETURNS.

The original cost of establishing a plantation ranges, according to local conditions, from $8 to $15 per acre. This does not include the expense of any subsequent treatment, such as cultivation or pruning.

The conditions of the site, the method of planting, and the care which has been given the plantation all materially affect the yield. Larch, hardy catalpa, and Osage orange should in fifteen years yield from 500 to 1,500 posts per acre. Plantations growing under excellent conditions have at this age yielded as high as 2,000 posts per acre.

If the site and species have been wisely selected and proper care has been exercised in planting and culture, profitable returns may be expected from forest plantations for post production. In addition, the convenience of a home supply of posts and stakes, and the protection afforded by the trees, enhances the value of the plantation. The exact amount of profit must depend, however, on the yield of posts per acre and the prices obtainable, which vary greatly in different localities. Examinations of larch plantations in Illinois, Iowa, and eastern Dakota showed that the annual financial returns per acre were approximately as great as from field crops properly managed, and the plantations required less care. In Illinois, also, hardy catalpa plantations on suitable soils gave returns equal to or somewhat greater than the usual farm crops.

Two hardy catalpa plantations were established in Pawnee County, Nebr., in 1890 and 1889, respectively. By contrast, they show well the possibilities and limitations of the species. No. 1 was planted on well-prepared virgin prairie soil; No. 2 on adjacent worn-out farm land. The soil was a deep, sandy loam underlaid with clay. The plantations received cultivation and pruning at the proper time.

PLANTATION NO. 1.

Cost per acre.		*Returns per acre.*	
Plants, 2,722 at $1.15 per thousand	$3.13	First-class posts, 647 at 14 cents	$90.58
Preparation of the ground, cultivation, and pruning	18.46	Second-class posts 1,363 at 9 cents	122.67
	21.59		
Interest on $21.59 for 14 years at 5 per cent interest compounded	21.16		
Total cost at end of 14 years	42.75	Total returns at end of 14 years	213.25

Net profit per acre, $170.50.

This profit represents an annual net return, with 5 per cent compound interest, of $8.69 per year.

PLANTATION NO. 2.

Cost per acre.		*Returns per acre.*	
Plants, 2,722 at $1.15 per thousand	$3.13	First-class posts, 18 at 14 cents	$2.52
Preparation of the ground, cultivation, and pruning	18.46	Second-class posts, 510 at 9 cents	45.90
	21.59		
Interest on $21.59 for 15 years at 5 per cent interest compounded	23.29		
Total cost at end of 15 years	44.88	Total returns at end of 15 years	48.42

Net profit per acre, $3.54.

This profit represents an annual net return, with 5 per cent compound interest, of $0.16 per year. Five years' additional growth would show a much greater proportionate return.

Approved.
JAMES WILSON,
Secretary.

WASHINGTON, D. C., *November 24, 1906.*